

# 2010-2011 San Francisco Collisions Report



**SFMTA**

Municipal Transportation Agency

**July 20, 2012**

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San Francisco Municipal Transportation Agency  
Sustainable Streets Division  
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## SUMMARY

- Non-fatal injury collisions totaled 3,111 in 2011. Injury collision totals are relatively unchanged since 2004.
- Fatal collisions totaled 28 in 2011. Of these fatalities, 17 were pedestrians and 3 were riding a bicycle.
- Approximately a third of non-fatal injury collisions were broadsides and unsafe speed was listed as the primary cause in approximately one-fifth of collisions.
- 2010 and 2011 had the lowest red light running collision totals of the past ten years.
- The 2011 pedestrian injury collision total of 807 was an increase relative to 2009-2010 totals. About a fourth of San Francisco's injury collisions involve pedestrians.
- The 2011 bicycle injury collision total of 630 was the highest in the past ten years. About a fifth of San Francisco's injury collisions involve bicycles.
- Muni reported injury and fatal collisions was 103 in 2011, the lowest total in the past five years.
- The San Francisco Municipal Transportation Agency (SFMTA) has taken and will continue to take a variety of measures specifically designed to reduce collisions at high collision intersections and citywide.

## **ABOUT THIS REPORT**

This report is prepared by the SFMTA in order to document long-term collision trends and intersections with the highest citywide collision totals. This information is used to identify locations that may need special attention and evaluate previous mitigation measures.

There are two main data sources used in this report. The source of the collision data prior to and including 2010 is the Statewide Integrated Traffic Records Systems (SWITRS) maintained by the California Highway Patrol (CHP). California Vehicle Code Section 20008 requires that local governments send their police collision reports to the State. The CHP enters this data into database files which are then processed by SFMTA. SWITRS totals for 2010 were not considered official by the CHP until the first quarter of 2012, thus delaying the preparation of this report. Collision data for 2011 is from the San Francisco Police Department. The 2011 data is not the official state total for San Francisco, but is provided now given the current delay in obtaining SWITRS totals. All figures in this report that include 2011 data do not include those reported by other police agencies in the City and are thus subject to be revised in the future.

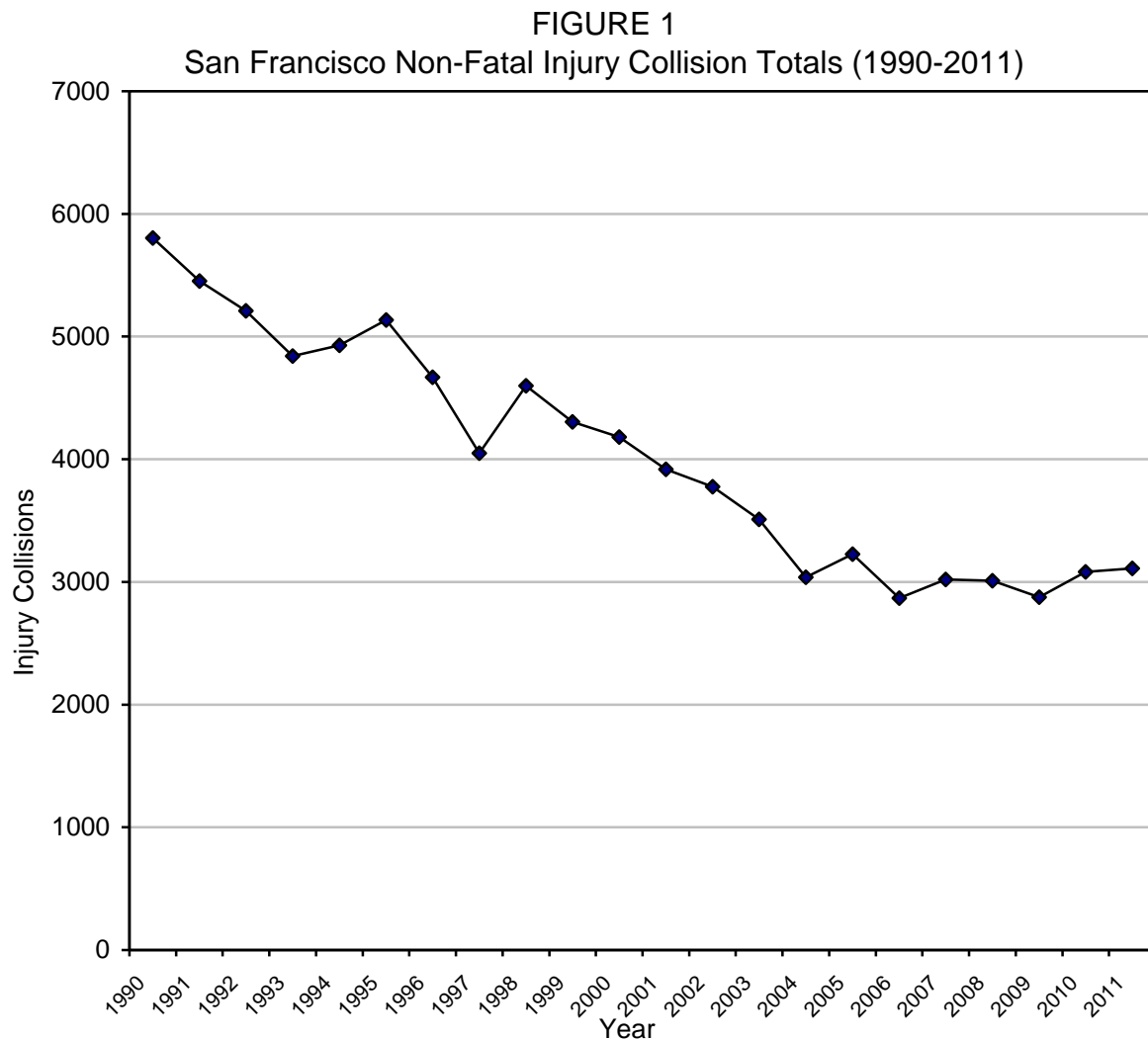
Due to limited police staff resources, property damage only (non-injury) collisions are generally underreported in San Francisco and therefore are not included in this report. Though some injury collisions are not reported as well, injury collisions have been reported more consistently over time. This report also focusses on collision totals rather than rates, since rates require detailed traffic volume information that is not available for all intersections.

Short-term annual increases in collisions at any one intersection or the city as a whole could be partly the result of random yearly variations. Out of the thousands of intersections in San Francisco, in any one year some will have more or fewer collisions than the expected annual average, even if the underlying conditions of the location have not changed. Focusing on multi-year trends can help reduce the effects of short-term fluctuations.

## **PART 1: CITYWIDE INJURY AND FATAL COLLISION TRENDS**

Reported non-fatal injury collisions in San Francisco totaled 3,081 in 2010 and 3,111 in 2011. These totals are in line with those reported since 2004 (Figure 1). While non-fatal injury collisions steadily declined until 2006, annual totals have unfortunately remained relatively unchanged since then. The total number of reported people injured by traffic collisions in 2010 was 3,940.

The number of collisions resulting in fatalities in 2010, 23, was one of the lowest that San Francisco has recorded (Figure 2). The number of collisions resulting in fatalities in 2011 was 28. In general, injury collisions are a more reliable indicator of collision trends because fatal collisions, being fewer in number, are subject to sharper fluctuations from year to year. This is illustrated in the higher annual variance seen in Figure 2 compared to Figure 1. Since 2004 annual fatal collision totals below 30 have been more common, a possible indication of an improving trend.



**Figure 1: San Francisco Non-Fatal Injury Collision Totals (1990-2011)**

Year	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	5,804	4,182	3,917	3,777	3,511	3,038	3,227	2,869	3,021	3,010	2,877	3,081	3,111

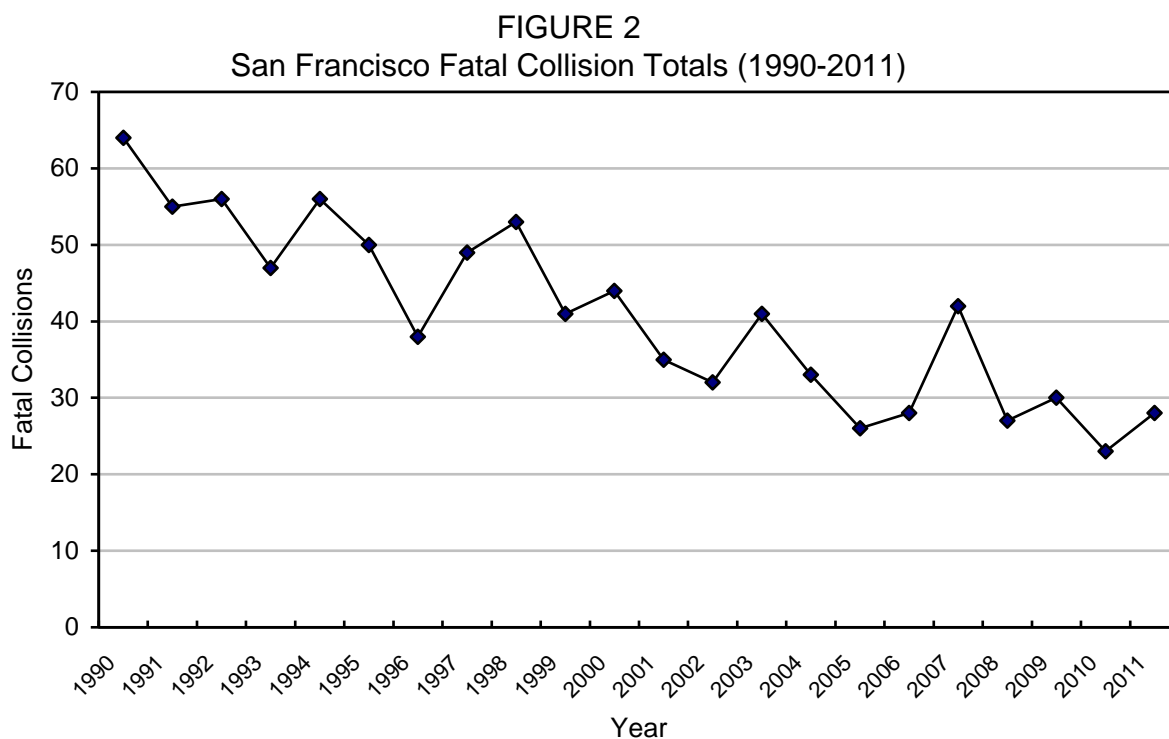


Figure 2: San Francisco Fatal Collision Totals (1990-2011)

Year	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	64	44	35	32	41	33	26	28	42	27	30	23	28

Table 1 lists the previous five-year non-fatal injury collision totals according to the three non-fatal injury severity categories used by all police departments in the state. The percentage of "other visible Injury" plus "severe injury" has increased over the past five years, going from 34 percent of the injury total in 2005 to 39 percent in 2010.

**TABLE 1**  
**San Francisco 2006-2010 Injury Collision Severity**  
(With percentage of annual total injury collisions)

Year	Complaint of Pain	Other Visible Injury	Severe Injury	Total
2010	1,902 (61%)	1,002 (33%)	177 (6%)	3,081
2009	1,782 (62%)	901 (31%)	194 (7%)	2,877
2008	1,889 (63%)	941 (31%)	180 (6%)	3,010
2007	1,937 (64%)	896 (30%)	188 (6%)	3,021
2006	1,895 (66%)	807 (28%)	167 (6%)	2,869

## PART 2: COLLISION TYPES AND CAUSES

Tables 2 and 3 show 2010 injury collision totals by primary collision type and cause. The two most common types of collisions, broadsides and vehicle-pedestrian, together comprise 52 percent of injury collisions. The top primary collision cause is speeding. Collisions, however, can be the result of more than one cause or set of conditions.

TABLE 2  
2010 Non-Fatal Injury Collisions by Primary Collision Type (Total of 3,081)

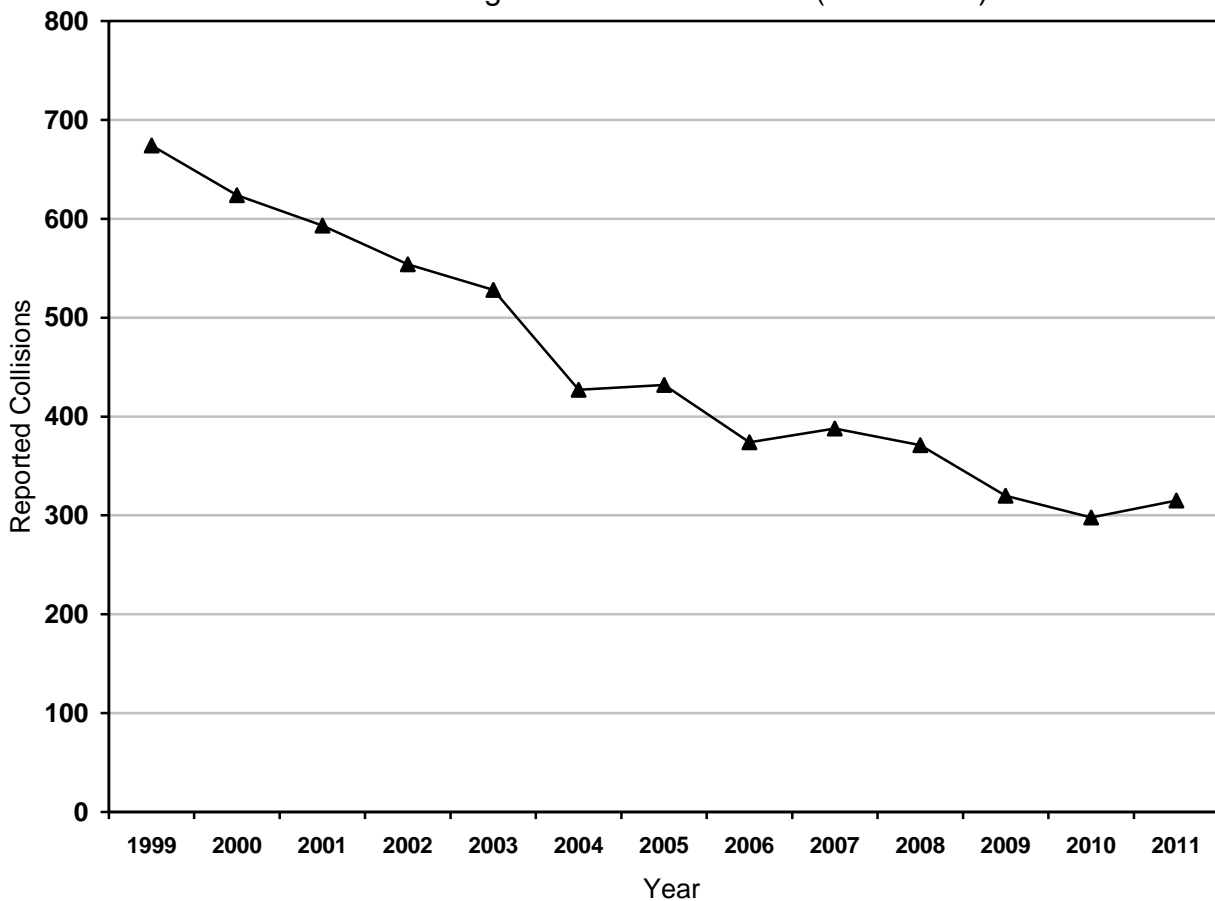
Type	Collisions	Percent
Broadside (Right-Angle)	918	30%
Vehicle-Pedestrian	673	22%
Rear-End	503	16%
Sideswipe	370	12%
Head-On	192	6%
Other	425	14%

TABLE 3  
2010 Non-Fatal Injury Collisions by Primary Collision Cause (Total of 3,081)

Cause	Collisions	Percent
Unsafe Speed	630	21
Vehicle Right-of-Way Violations	396	13
Violation of Traffic Signals and Signs	379	12
Driver Violations of Pedestrian Right-of-Way	347	11
Improper Turning	253	8
Violations by the Pedestrian	224	7
Other	852	28

Figure 3 illustrates the trend in injury collisions resulting from violation of California Vehicle Code Section 21453(A), failure by a motorist to obey red light signal indication. 2010 recorded the lowest broadside and red light violation injury collision totals of the past ten years. Traffic signal hardware and timing improvements described in this report appear to have helped reduce these types of collisions at certain intersections. This decrease also coincides with the city's deployment of red light photo enforcement starting in 1997 and other efforts aimed at reducing the incidences of red light running.

**FIGURE 3**  
San Francisco Injury  
Red Light Violation Collisions (1999-2011)



**Figure 3: San Francisco Injury Red Light Violation Collisions (1999-2011)**

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total Red Light Running	674	624	593	554	528	427	432	374	388	371	320	298	315

## PART 3: HIGHEST COLLISION INTERSECTIONS

About two-thirds injury collisions in San Francisco occur at intersections. As documented in previous annual reports, the number of intersections with double digit annual injury collision totals has decreased thanks in part to San Francisco's targeted safety efforts.

Table 4 is a list of the highest injury collision intersections for the most recent three-year period, 2009-2011. This extended analysis period identifies locations that have had cumulative higher totals. Figures 4 through 11 describe the ten-year collision pattern for these eight intersections

TABLE 4  
Three-Year Highest Injury Collision Intersections, 2009-2011  
Intersections with 16 or more injury collisions

Street A	Street B	2009-2011 Injury Collisions
Market Street	Octavia Boulevard	30
4 <sup>th</sup> Street	Harrison Street	24
Fell Street	Masonic Avenue	20
13 <sup>th</sup> Street	Mission / Otis sts	19
Duboce Avenue	Valencia Street	18
13 <sup>th</sup> Street	South Van Ness Ave	18
16 <sup>th</sup> Street	Potrero Avenue	16
Hayes Street	Van Ness Avenue	16

Intersections dropping out of the highest three-year injury collision list include 19<sup>th</sup> Avenue and Sloat Boulevard, Bayshore Boulevard and Paul Avenue, Bayshore Boulevard and Silver Avenue, and Essex and Harrison streets. SFMTA has taken various measures at these locations, including signal timing and hardware changes.



## Market Street and Octavia Boulevard

2009-2011 injury collisions: 30

Primary Pattern: Eastbound Market Street illegal vehicle right turns to freeway on-ramp colliding with eastbound bicyclists travelling in bicycle lane.

Engineering Changes: Intersection completely redesigned as part of Octavia Boulevard project (opening date September 2005). City has taken a number of enforcement, signage, timing, and channelizing measures to improve compliance with right-turn restriction on eastbound Market, most recently adding another “No Left Turn” sign (October of 2011). Crosswalks markings will be upgraded in 2012.

Collision Trend: Increase in collision totals since 2005. The intersection had the highest collision total for San Francisco in 2011 (13 injury collisions), with nine of these being vehicle-bicycle collisions.

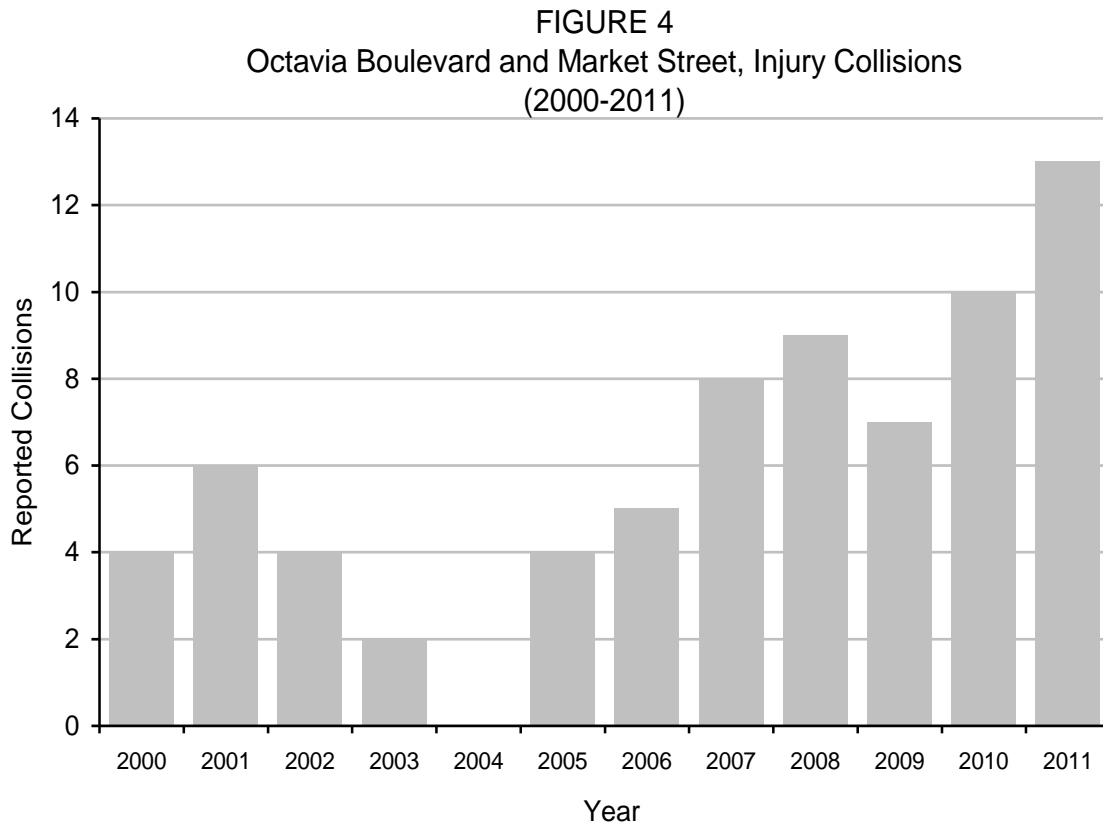


Figure 4: Octavia Boulevard and Market Street, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	4	6	4	2	0	4	5	8	9	7	10	13

## 4<sup>th</sup> and Harrison Streets

2009-2011 injury collisions: 24

Primary Pattern: Broadsides and 4<sup>th</sup> Street southbound sideswipe collisions

Engineering Changes: SFMTA has added mast arm signals to improve signal visibility and overhead mast arm traffic lane signs to clarify which lanes on 4<sup>th</sup> Street can be used to access the freeway. Signal timing was adjusted in 2011. 4<sup>th</sup> Street is currently under construction as part of the SFMTA Central Subway project.

Collision Trend: Location saw a sharp drop in collisions after 2000-2001. The collision increase during 2009-2010 was followed by a sharp drop in 2011. SFMTA will continue to monitor.

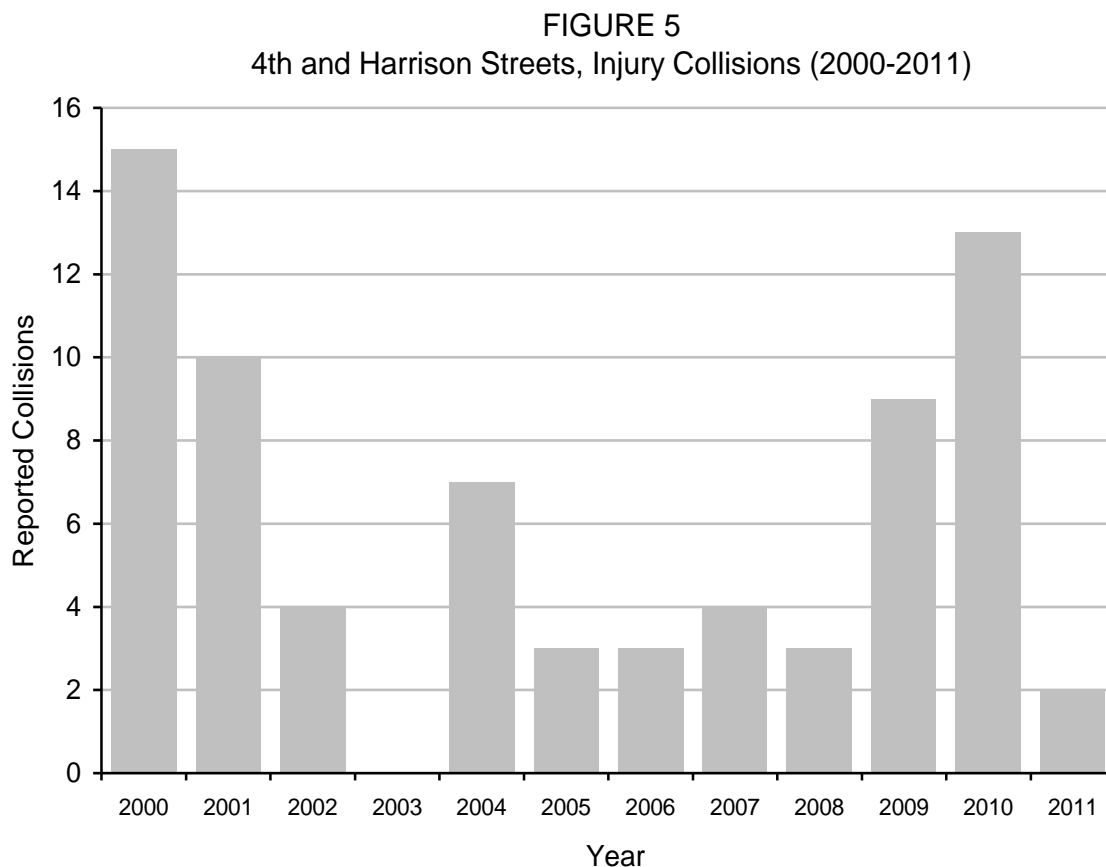


Figure 5: 4<sup>th</sup> Street and Harrison Street, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	15	10	4	0	7	3	3	4	3	9	13	2

# Fell Street and Masonic Avenue

2009-2011 injury collisions: 20

Primary Pattern: Westbound Fell Street left turns with Panhandle path bicycles.

Engineering Changes: In 2008 SFMTA installed a bicycle signal treatment that separated Fell Street left-turning motor vehicles from bicycles and pedestrians crossing Masonic Avenue on the south side at Fell Street. Red light camera was activated in late 2011. Further signal design changes are to be completed in the summer of 2012.

Collision Trend: 2011 saw the highest collision total for the intersection, with 11 total reported, five of these being vehicle-bicycle collisions.

FIGURE 6  
Fell Street and Masonic Avenue, Injury Collisions (2000-2011)

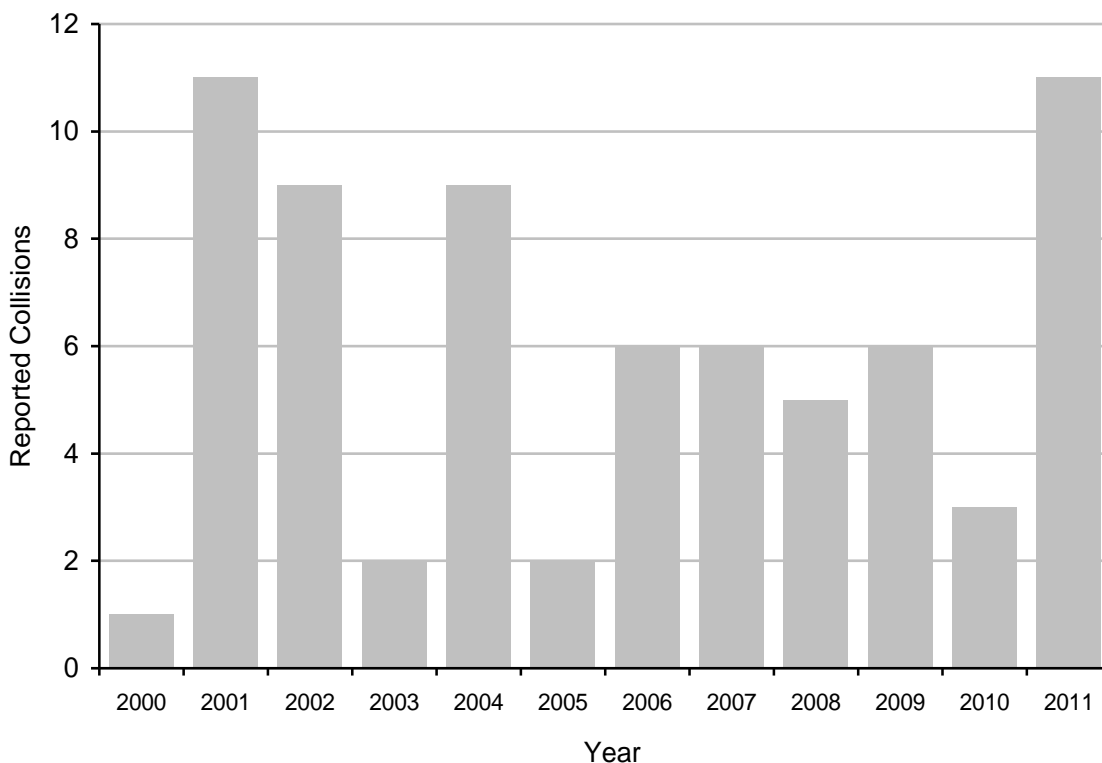


Figure 6: Fell Street and Masonic Avenue, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	1	11	9	2	9	6	6	6	5	6	3	11

13<sup>th</sup>, Mission, and Otis Streets

2009-2011 injury collisions: 19

Primary Pattern: None

Engineering Changes: Intersection was reviewed in 2011 by SFMTA and signal timing was changed in November of 2011. SFMTA modified the all-red signal clearance phases, pedestrian crossing times, and coordination with adjacent traffic signals.

Collision Trend: Location has had a varying collision pattern, with collisions most recently increasing in 2010-2011.

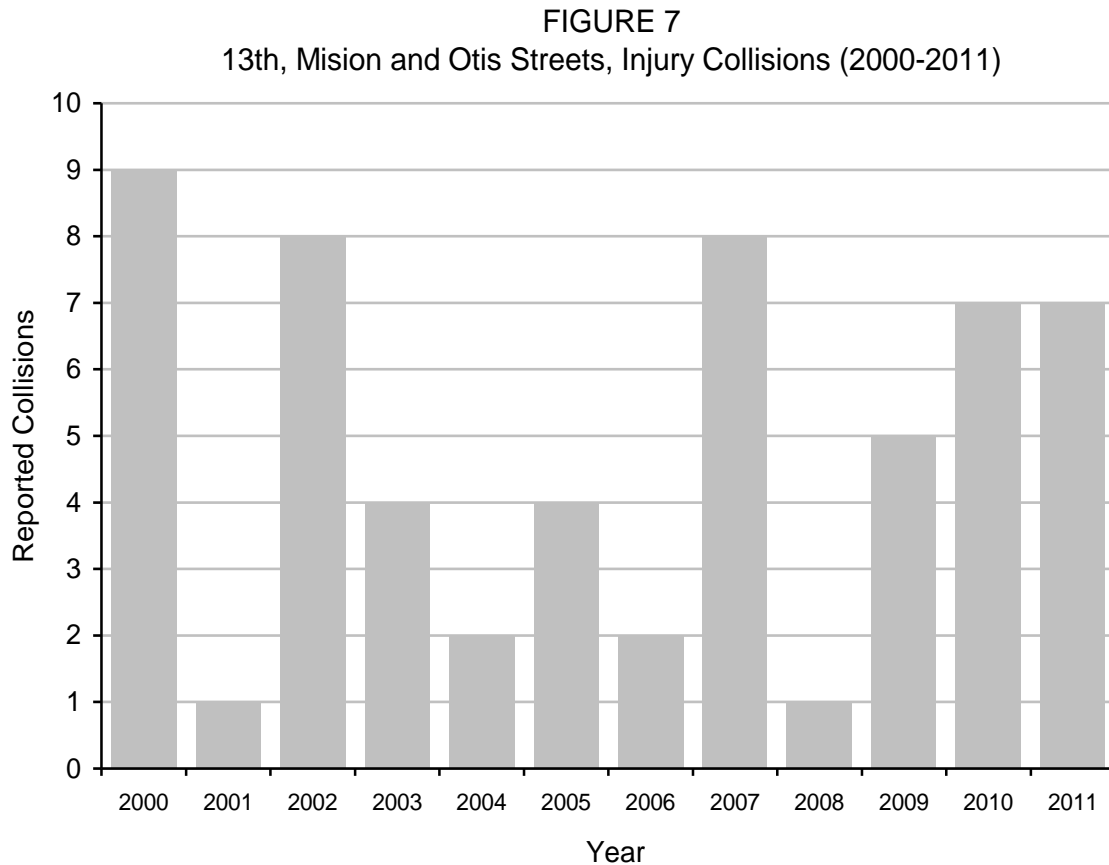


Figure 7: 13<sup>th</sup>, Mission, and Otis Streets, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	9	1	8	4	2	4	2	8	1	5	7	7

Duboce Avenue and Valencia Street

2009-2011 injury collisions: 18

Primary Pattern: Vehicle-bicycle collisions

Engineering Changes: The location was included in a signal upgrade contract that added a signal mast arm facing westbound Duboce Avenue. Signal was retimed in 2010 to update pedestrian crossing time and all-red clearance phases. SFMTA staff will review pattern of bicycle-vehicle collisions (8 bicycle-involved collisions 2008-2010).

Collision Trend: Sustained increase in collisions since 2006-2007.

FIGURE 8  
Duboce Avenue and Valencia Street, Injury Collisions (2000-2011)

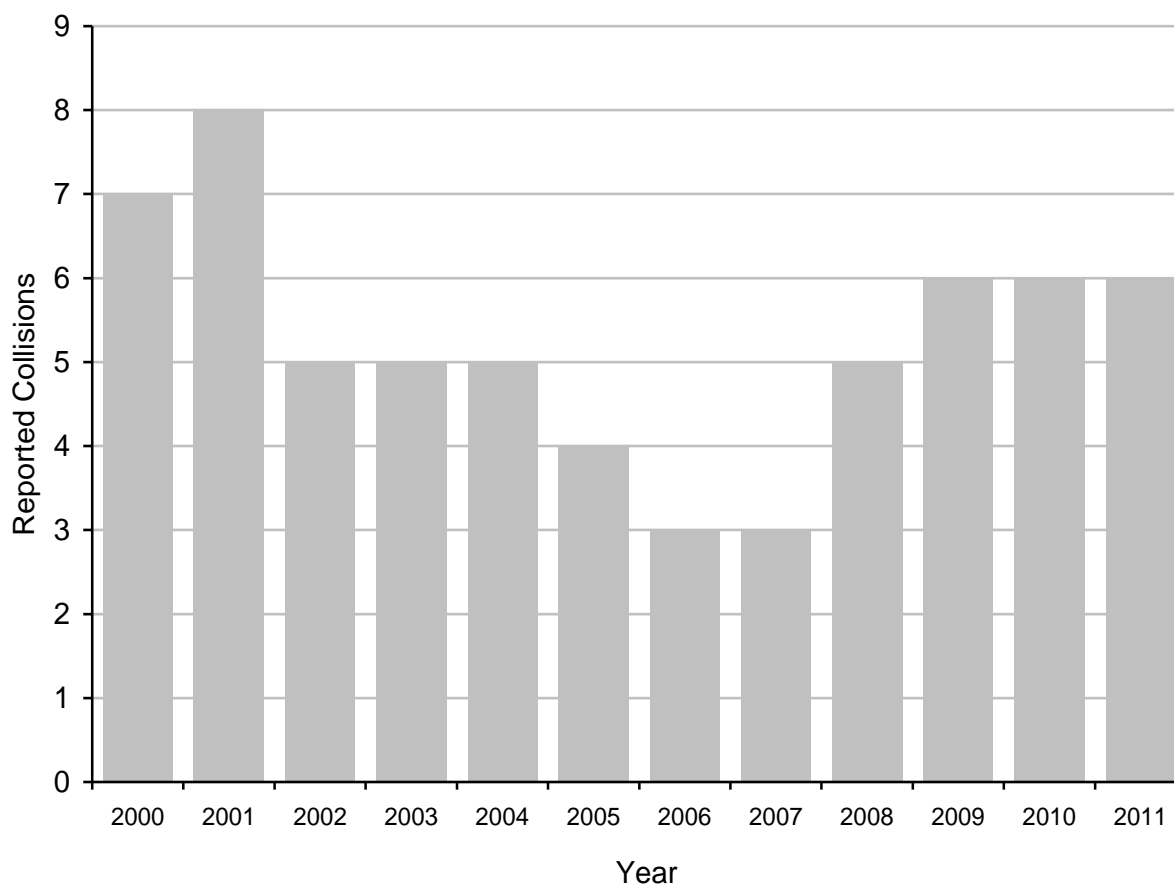


Figure 8: Duboce Avenue and Valencia Street, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	7	8	5	5	5	4	3	3	5	6	6	6

13<sup>th</sup> Street and South Van Ness Avenue

2009-2011 injury collisions: 18

Primary Pattern: None

Engineering Changes: Since the closure of the Central Freeway in 1996 various traffic changes have been made here including revised traffic lanes, new left turn and right turn signalization for 13th Street, and longer yellow and all-red clearance signal phases. SFMTA modified the traffic signal timing in December 2007 to reduce the signal's total cycle length after the opening of Octavia Boulevard. In 2008 SFMTA installed pedestrian countdown signals crossing 13th Street. Intersection will be reviewed in 2012 for additional signal timing changes.

Collision Trend: Total increased in 2010 to 9 reported injury collisions, but then dropped to a ten year low of 4 injury collisions in 2011.

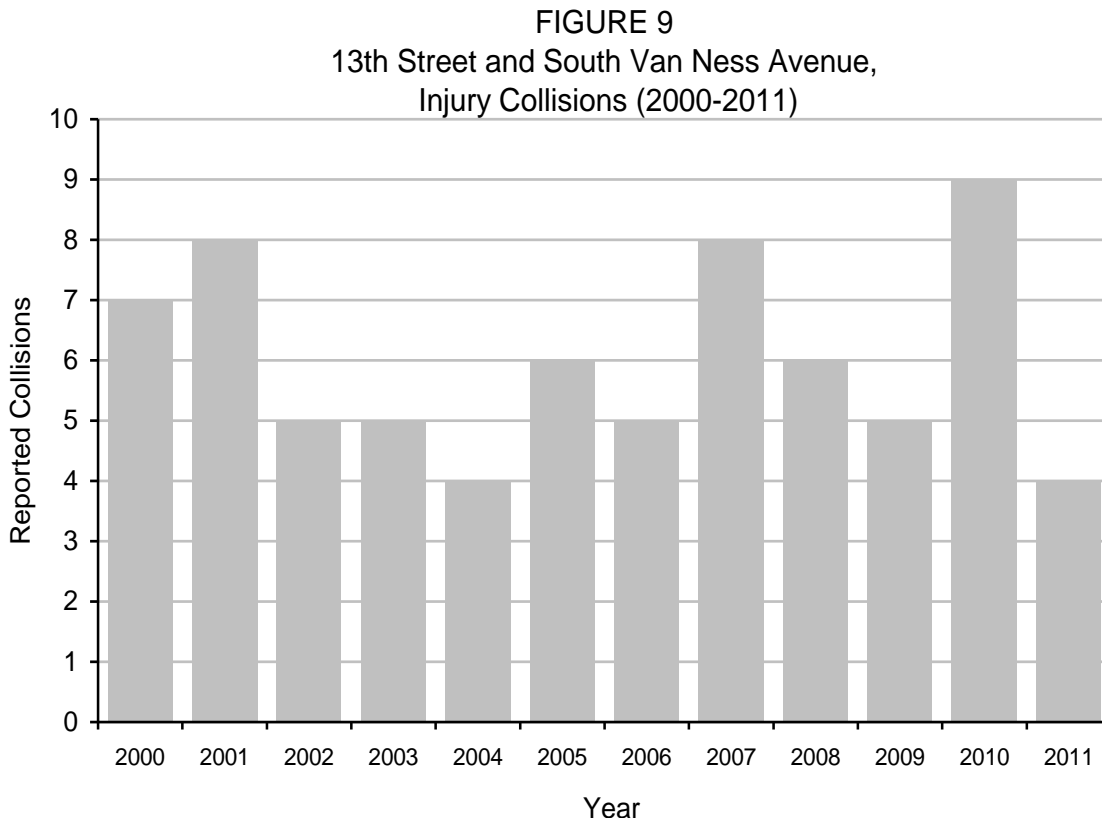


Figure 9: 13<sup>th</sup> Street and South Van Ness Avenue, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	7	8	5	5	4	6	5	8	6	5	9	4

16<sup>th</sup> Street and Potrero Avenue

2009-2011 injury collisions: 16

Primary Pattern: None

Engineering Changes: Intersection received major signal upgrade in 2005, including new pedestrian and overhead signals. Potrero Avenue from 17<sup>th</sup> to Division Streets was redesigned in 2011 with the addition of bicycle lanes, new left turn lanes, and removal of two of the six through traffic lanes. Signal timing was adjusted on October of 2010.

Collision Trend: Collision totals steadily increased since 2006, with a high of 9 injury collisions in 2009. Collision totals have dropped since 2009, however, with 2011 recording two injury collisions.

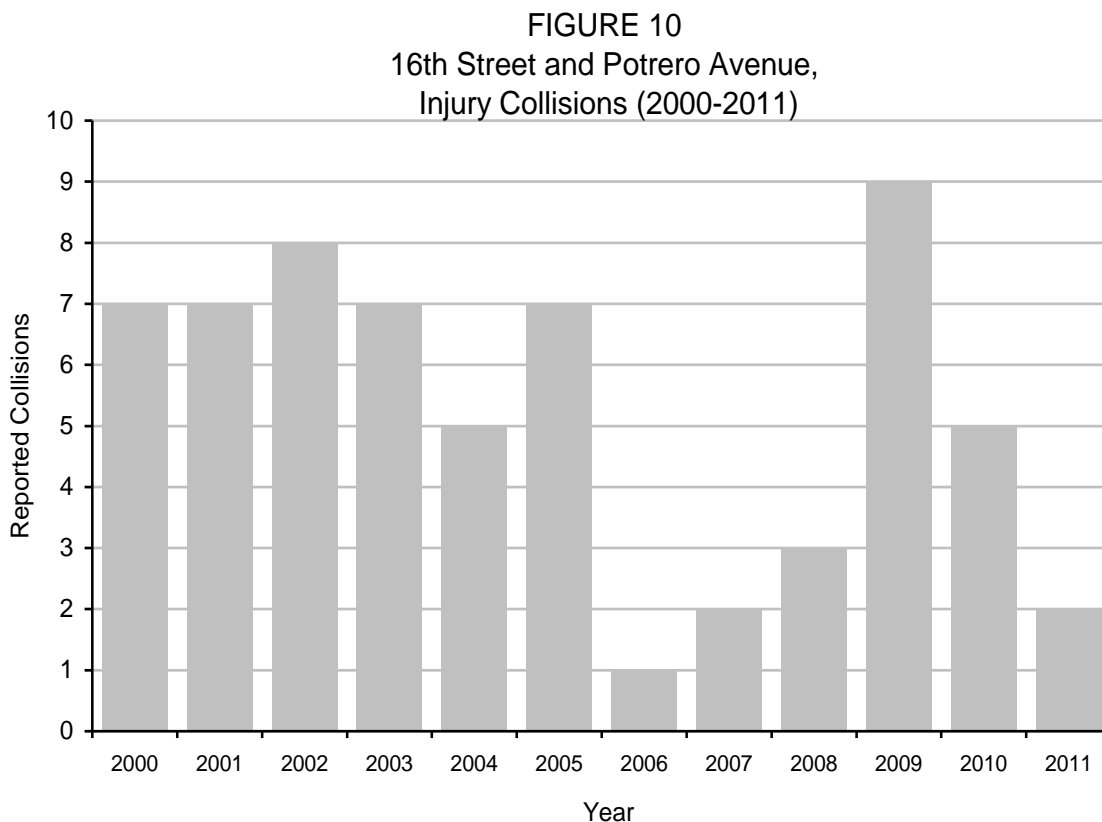


Figure 10: 16<sup>th</sup> Street and Potrero Avenue, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	7	7	8	7	5	7	1	2	3	9	5	2

# Hayes Street and Van Ness Avenue

2009-2011 injury collisions: 16

Primary Pattern: Left turn collisions

Engineering Changes: SFMTA adjusted traffic signal timing in 2010 to increase duration of all-red clearance phase. In 2011 Hayes Street was redesigned to be two-way west of Van Ness Avenue. Intersection will be significantly redesigned as part of the Van Ness Avenue Bus Rapid Transit project. Changes will include installation of pedestrian signals and possible changes to Van Ness Avenue left turn controls.

Collision Trend: 2009 had the highest collision total in ten years, but totals declined in 2010 and 2011.

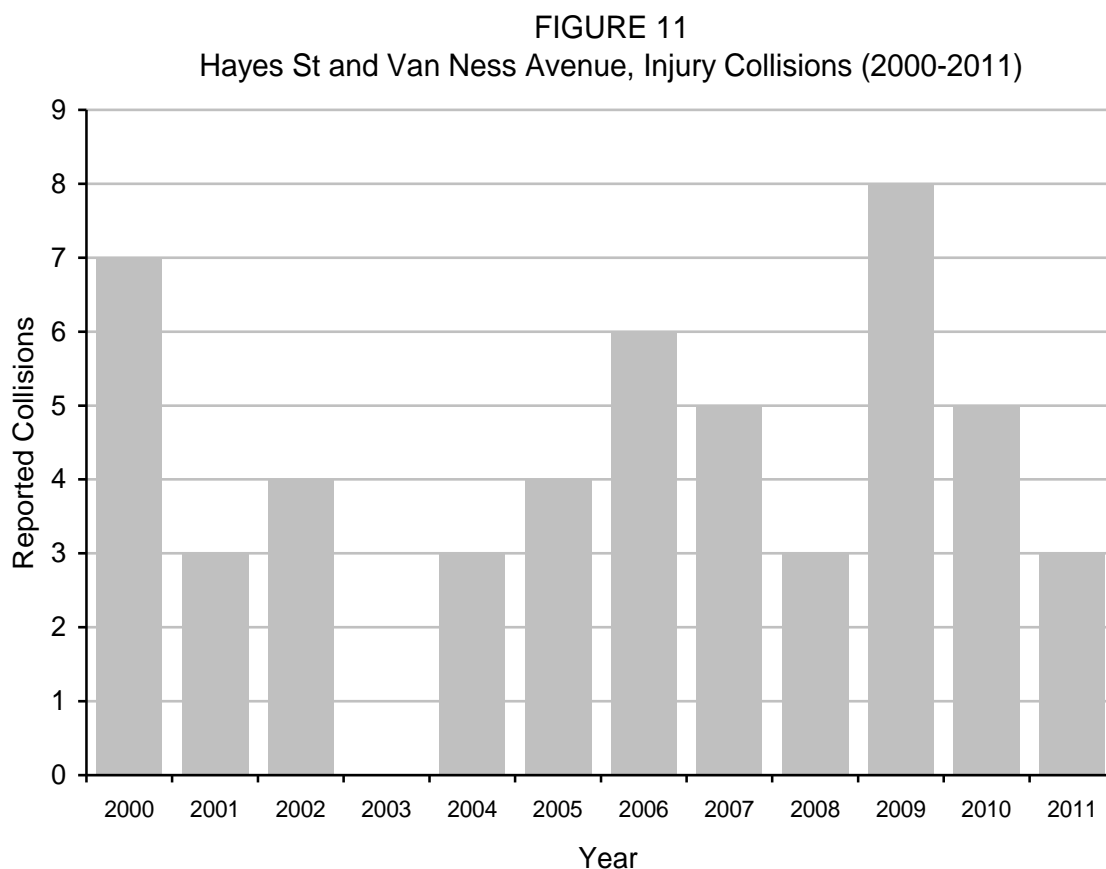


Figure 11: Hayes Street and Van Ness Avenue, Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	7	3	4	0	3	4	6	5	3	8	5	3



## PART 4: PEDESTRIAN AND BICYCLE COLLISIONS

Approximately a fourth of San Francisco's injury collisions involve pedestrians. Pedestrian collisions have remained a relatively constant 25 percent of total injury collisions in San Francisco over the past ten years (Figure 12). That is, pedestrian collisions appear to be decreasing or increasing in proportion to the changes in overall collision totals.

Injury collisions involving bicycles, however, have increased as a share of the City's reported injury total. From 2000 to 2004, ten percent of collisions involved a person riding a bicycle. Eleven years later that percentage has doubled to 21 percent as bicycle collisions have increased while other types of collisions have not.

FIGURE 12 - San Francisco Pedestrian and Bicycle Injury Collisions by Percentage of Year's Total (2000-2011)

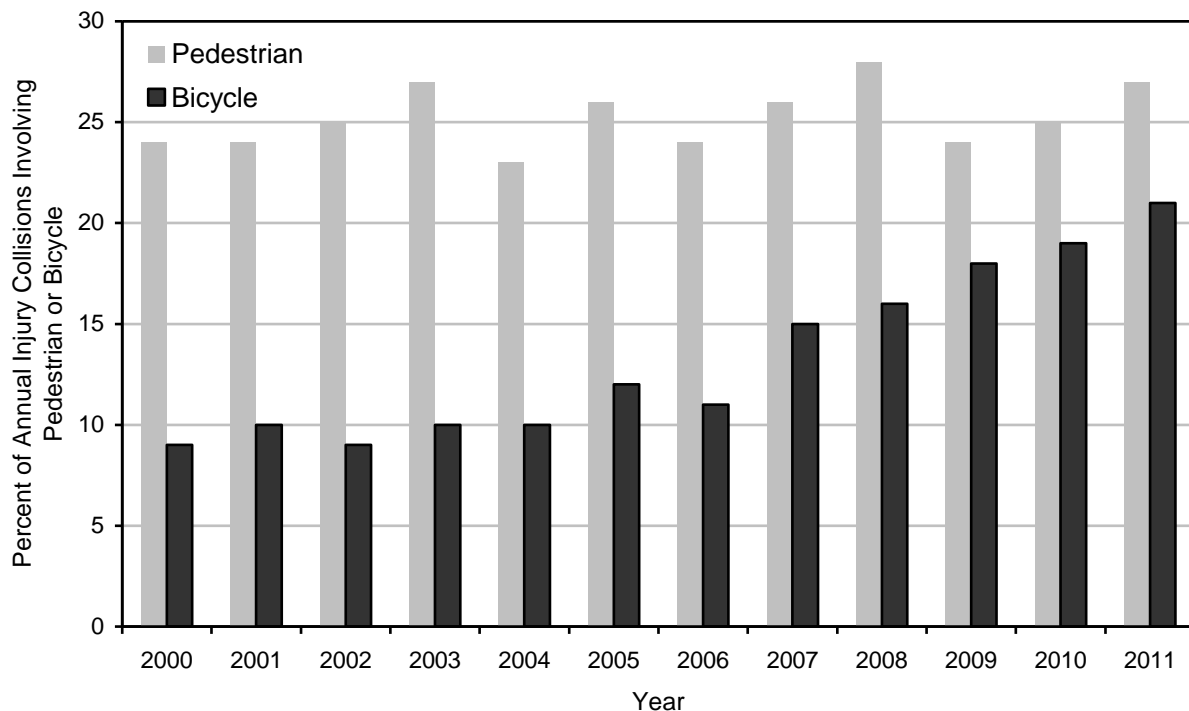


Figure 12: San Francisco Pedestrian and Bicycle Injury Collisions By Percentage of Year's Total Injury Collisions (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total Injury	4,182	3,917	3,777	3,511	3,038	3,227	2,869	3,021	3,010	2,877	3,081	3,111
Pedestrian %	24	24	25	27	23	26	24	26	28	24	25	27
Bicycle %	9	10	9	10	10	12	11	15	16	18	19	21

## Pedestrian Collisions

The 2011 total of 807 injury collisions involving a pedestrian is up 3 percent from the 784 injury collisions reported in 2010 (Figure 13). Up to 2004 pedestrian collisions continued a steady decline from the over 1,000 incidents that were recorded annually in the 1990's. Since 2004 pedestrian injury collisions have been relatively unchanged. Though 2009 recorded the lowest San Francisco pedestrian injury total in the past decades, collisions in 2010-2011 unfortunately increased.

FIGURE 13  
San Francisco Injury Collisions Involving Pedestrians  
(2000-2011)

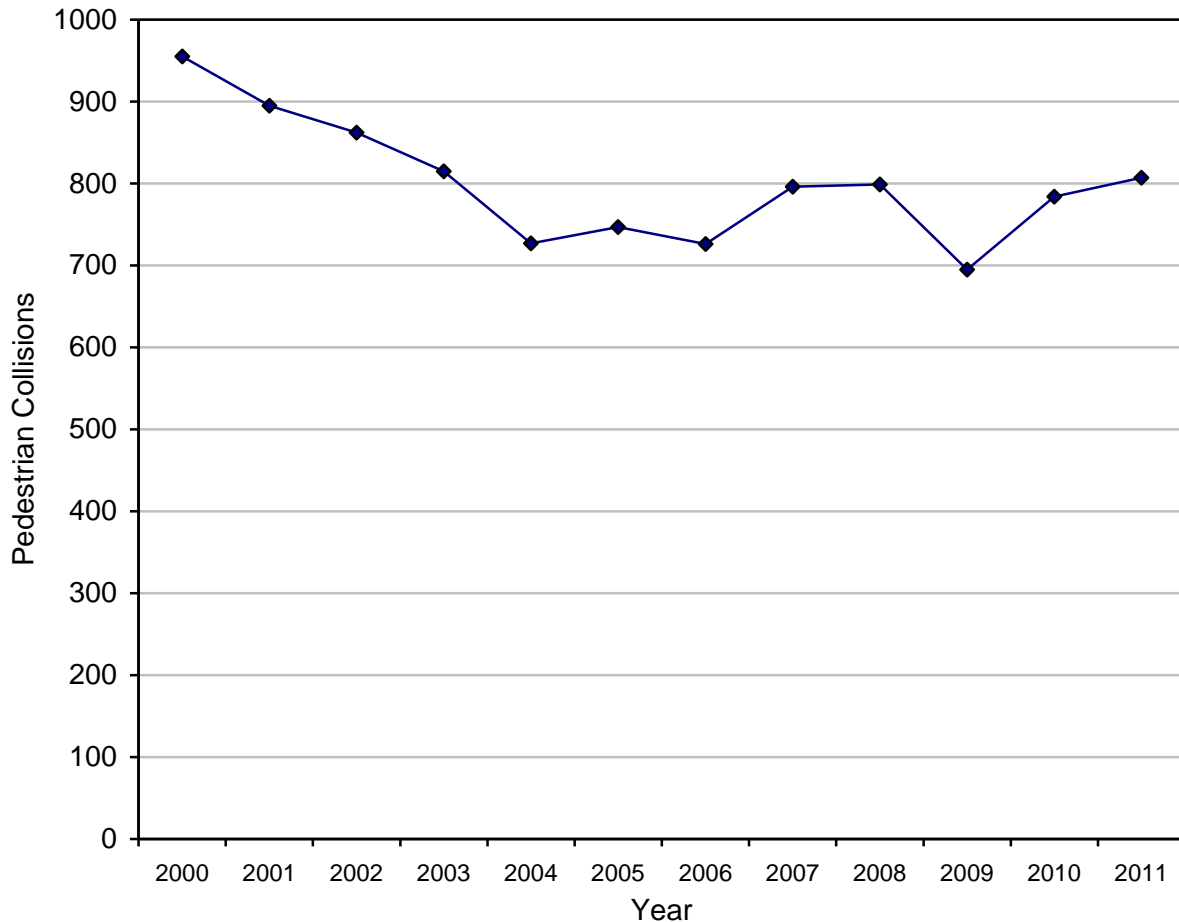


Figure 13: San Francisco Injury Collisions Involving Pedestrians (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	955	895	862	815	727	747	726	796	799	695	784	807

The number of fatal collisions involving a pedestrian was 17 in 2011, up from the 14 reported in 2010 (Figure 14). More than half of San Francisco's fatal collisions involve pedestrians. The recent trend among pedestrian fatal collisions appears to be slightly down, with the four lowest annual totals reported after 2004. The City, however, has yet to average less than one pedestrian fatality a month in any one year.

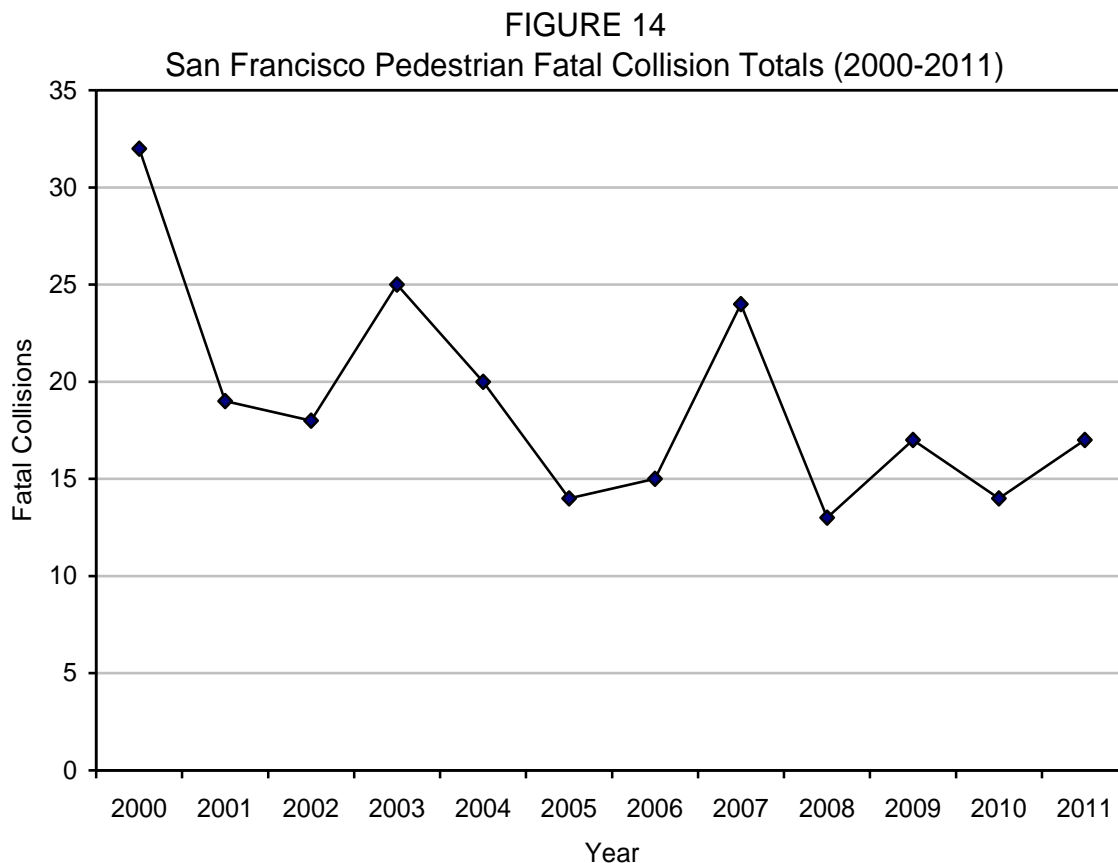


Figure 14: San Francisco Fatal Collision Totals (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	32	19	18	25	20	14	15	24	13	17	14	17

Tables 5 and 6 summarize which specific California Vehicle Code (CVC) sections are the most likely primary cause of a pedestrian collision. Table 5 shows the violations when the pedestrian is listed as party one, or generally the party most at fault according to the collision report. Table 6 shows the violation types when the pedestrian was not party one, meaning another party was most likely at fault. About two-thirds of collisions are the fault of the vehicle driver according to the SFPD collision reports. The most

common violation cause (41 percent) was CVC 22950(A), the section that makes it illegal for someone driving a vehicle not to yield to a pedestrian crossing at a crosswalk. This could happen when motorists are making left or right turns at intersections, or when a vehicle fails to yield at a crosswalk when going straight.

Many collisions can be the result of more than one violation factor and conditions not readily apparent at the scene, but typically the SFPD will determine through witness and party statements the most likely cause of the collision.

Table 5 – 2011 Most Common Vehicle-Pedestrian Injury Collision Factors by California Vehicle Code Violation Section when Pedestrian Could be at Fault

CVC Section	General Description of CVC Violation	
21954(A)	Failure to yield right-of-way outside crosswalk	95
21955	Crossing between signalized intersections	64
21950(B)	Failure to watch for cross traffic at crosswalk	36
21453(D)	Violation of signal red light	33
21456(B)	Disobedience of pedestrian signal indications	13
21956	Pedestrian walking on roadway	7
Other		18
TOTAL		266

Table 6 – 2011 Most Common Vehicle-Pedestrian Injury Collision Factors by California Vehicle Code Violation Section when Motorist Could be at Fault

CVC Section	General Description of CVC Violation	
21950(A)	Failure to yield to pedestrian at a crosswalk	327
22350	Driving at unsafe speed given conditions of roadway	53
22106	Unsafe maneuver or backing after being parked	42
21453(A)	Violation of signal red light	26
22450	Failure to stop at a STOP sign limit line	9
21952	Failing to yield to pedestrians when driving over sidewalk	8
21950(C)	Failure to exercise due care for pedestrian at crosswalk	6
22107	Changing lanes/ turning unsafely or without signaling	6
21756(A)	Failure to yield to pedestrians exiting a streetcar or bus	5
21451(A)	Failure to yield to pedestrians on green signal light	4
21951	Overtaking a vehicle that is yielding to a pedestrian	4
21663	Driving on sidewalk	3
21954(B)	Not exercising due care for pedestrian outside crosswalk	3
Other		45
TOTAL		541

Table 7 shows highest injury vehicle-pedestrian collision locations for the three-year period 2009-2011. Golden Gate Avenue and Jones Street, as well as 6<sup>th</sup> Street and Howard Street, are both locations where SFMTA has undertaken measures in the past to improve pedestrian safety conditions, including signal timing and lane control changes. The former top location for pedestrian injury collisions, 6<sup>th</sup> and Market streets, recorded four pedestrian injury collisions during this three-year period, an improvement over previous three-year totals. Additional focus is being given to making improvements on the small percentage of city streets where the majority of injury collisions occur.

**TABLE 7**  
Three Year Highest Injury Vehicle-Pedestrian Collision Intersections  
Intersections with seven or more collisions resulting in injury, 2009-2011

Street A	Street B	2009-2011 Injury Collisions
Golden Gate Ave	Jones Street	9
6 <sup>th</sup> Street	Howard Street	8
7 <sup>th</sup> Street	Mission Street	7

At the citywide level, SFMTA has implemented a variety of measures to improve pedestrian safety, including installing new pedestrian signs, crosswalk markings, parking prohibitions, signal timing settings, countdown pedestrian signals, audible signals, traffic regulations, speed regulation changes, road diets, and traffic calming measures. General signal upgrades also benefit pedestrians by installing pedestrian signals at intersections where these devices are not present and by improving the visibility of signal indications to motorists.

#### Bicycle-Involved Collision Totals

There were 630 injury collisions in 2011 involving a bicycle as a party, up 5 percent from the 599 total recorded in 2010. The 2011 injury collision total is the highest in the past ten years. Bicycle-involved collisions have been steadily increasing since 2002 (Figure 12). While the exact reasons for this increase are not known, it has coincided with a statistically significant increase in the number of bicyclists riding on various city streets, as measured by annual counts taken by the SFMTA. Table 8 suggests there may be some relationship between the increases in recorded bicycle activity and resulting bicycle-involved collisions. The “safety in numbers” effect of decreasing collisions as bicycle riding becomes more prevalent does not appear to be the case so far in San Francisco.

Until 2009 the City was under an injunction preventing any bicycle-related infrastructure changes from taking place prior to the completion of extensive environmental analysis. The SFMTA is now making significant upgrades along many important bicycle routes.

TABLE 8  
2006 and 2011 Bicycle Sample Counts<sup>1</sup> and Bicycle Involved Injury Collisions

	2006	2011	Percentage Increase
Bicycle Counts	4,862	8,314	71%
Bicycle Collisions	343	630	84%

FIGURE 15  
San Francisco Injury Collisions Involving Bicycles  
(2000-2011)

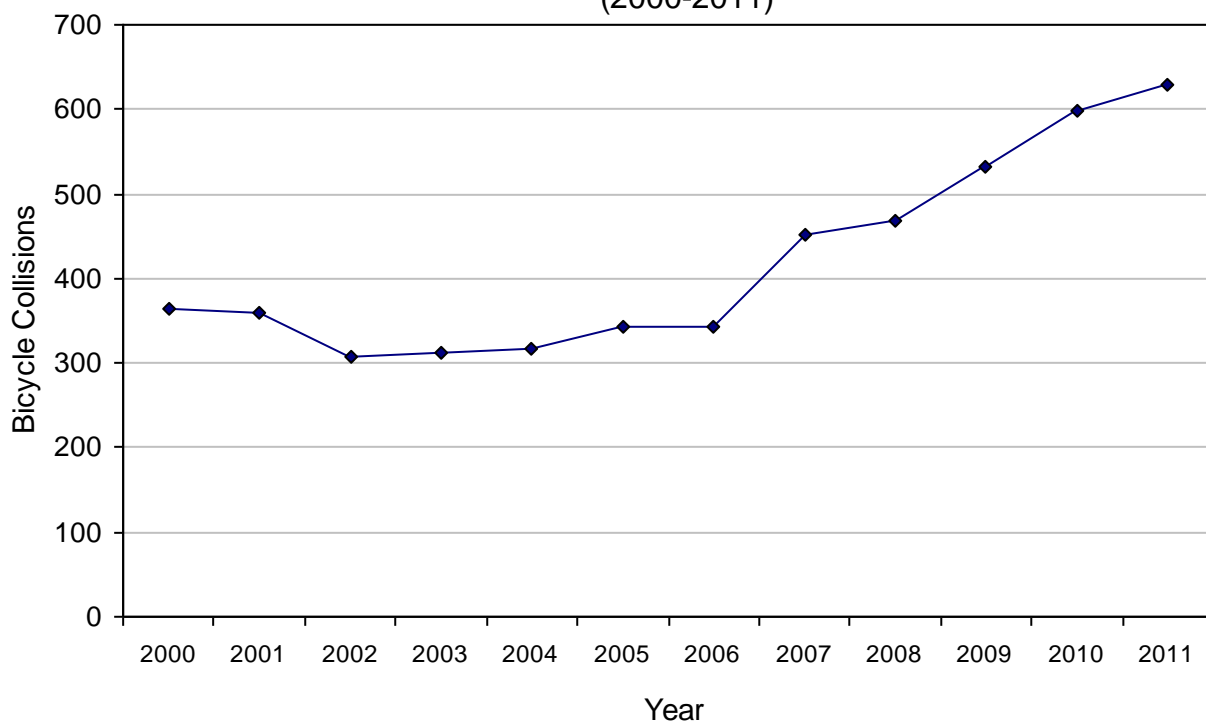


Figure 15: San Francisco Injury Collisions Involving Bicycles (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	364	360	307	311	316	343	343	451	468	531	599	630

<sup>1</sup> 2011 SFMTA Bicycle Count Report, page 9.

Table 9 summarizes fatal bicycle collision totals for 2002-2011. 2011 saw the highest fatal collisions involving bicycles in the past ten years. Two of the collisions involved a bicycle colliding with a pedestrian, with one of them resulting in a pedestrian fatality (The Embarcadero at Mission Street).

TABLE 9 - Fatal Collisions Involving Bicycles, 2002-2011

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Fatal Collisions	1	1	1	2	2	1	3	1	1	4

Tables 10 list collision types for collisions in which a bicycle was involved. Table 11 shows how a majority of bicycle-involved collisions occur at intersections.

TABLE 10  
2010 Non-Fatal Injury Motor Vehicle-Bicycle Collisions by Collision Types

Type	Collisions	Percent
Broadside (Right-Angle)	207	41%
Sideswipe	121	24%
Rear-End	30	6%
Head On	28	5%
Other	117	23%

TABLE 11  
2010 Non-Fatal Injury Bicycle Collisions by Location

Cause	Collisions	Percent
Intersection	361	60%
Non-Intersection	238	40%

Table 12 – 2011 Most Common Vehicle-Bicycle Injury Collision Factors  
by California Vehicle Code Violation Section when Bicycle Rider Could be at Fault

CVC Section	General Description of CVC Violation	
22350	Driving at unsafe speed given conditions of roadway	100
22450	Failure to stop at a STOP sign limit line	34
21453(A)	Violation of signal red light	32
21650.1	Failure to operate in same direction as other vehicles	26
22107	Changing lanes/turning unsafely or without signaling	13
21804	Failure to yield to cross traffic from driveway or alley	12
21658	Unsafe lane change	10
21755	Unsafe passing or overtaking of another vehicle	9
21201(D)	Insufficient lights or reflectors on bicycle	6
21657	Driving the wrong way on a one-way street	5
21950(A)	Failure to yield to pedestrian at a crosswalk	5
Unknown		19
Other Code		54
TOTAL		325

Table 13 – 2011 Most Common Vehicle-Bicycle Injury Collision Factors  
by California Vehicle Code Violation Section when Motorist Could be at Fault

CVC Section	General Description of CVC Violation	
22107	Changing lanes/ turning unsafely or without signaling	52
22517	Unsafe opening of vehicle door	49
21801	Failure to yield right-of-way when making left or U-turn	45
22350	Driving at unsafe speed given conditions of roadway	20
22106	Unsafe maneuver or backing after being parked	13
21802	Failure to yield after coming to a stop at a STOP sign	11
21658	Unsafe lane change	10
22101(D)	Disobedience to posted turn restriction signs	8
21451(A)	Failure to yield to pedestrians on green signal light	6
21804	Failure to yield to cross traffic from driveway or alley	6
22102	Failure to make safe U-turn in business district	6
21453(A)	Violation of signal red light	6
21750	Unsafe overtaking or passing maneuver to the left	5
22100(A)	Failure to make right turn as close as practical to curb	5
22450	Failure to stop at a STOP sign limit line	5
Unknown		15
Other Code		43
TOTAL		305



Tables 12 and 13 summarize which specific California Vehicle Code sections are the most likely primary cause of a collision that involved a bicycle. Table 12 shows the violations when the bicycle is listed as party one, or generally the party at fault according to the collision report. Table 13 shows the violation types when the bicycle was not party one, meaning another party was most likely at fault.

Fault for collisions seems to be evenly split among bicycle riders and motorists according to the SFPD collision reports. The most common violation cause by the bicyclist was unsafe speed (16 percent of total), and on the part of motorists it was not signaling a turn (8 percent of total). The second most common collision cause on the part of motorists involved not checking for bicycles before opening a door (8 percent of total) closely followed by failure to yield right of way when making a turn (8 percent of total). The second and third most common collision cause on the part of bicycle riders was violation of traffic control devices such as STOP signs and traffic signals (10 percent of total).

Table 14 is a list of the highest bicycle injury intersections for the last three years on record. The top two locations, Market Street at Octavia Boulevard and Fell Street at Masonic Avenue, have been previously discussed. SFMTA made bicycle lane striping changes on Market Street at Valencia Street in 2011 to reduce the likelihood of Market Street right-turn hook collisions. Polk and Ellis Streets will be reviewed by SFMTA staff.

TABLE 14  
Highest “Motor Vehicle Involved with Bicycle” Injury Collision Intersections  
7 or more injury reported collisions 2009-2011

Street A	Street B	2009-2011 Injury Collisions
Market Street	Octavia Boulevard	21
Market Street	Valencia Street	13
Fell Street	Masonic Avenue	12
Duboce Avenue	Valencia Street	8
Polk Street	Ellis Street	7

### Bicycle-Pedestrian Collisions by Area

Table 15 summarizes percentage of citywide collisions being reported for each Board of Supervisors district. There are a higher proportion of overall, pedestrian, and bicycle collisions occurring in District 6. District 3 also had higher percentages of pedestrian collisions, and District 5 a higher percentage of bicycle collisions. While this is consistent with these districts having relatively higher pedestrian and bicycle activity, it also indicates a need to prioritize improvements in the northeast quadrant of the city for these modes.



TABLE 15  
Citywide Five Year (2007-2011) Reported Collision Distribution  
By Board of Supervisor Districts  
(Totals and percentages exceed 100 percent due to collisions on district borders)

District	Percent of Overall Total	Percent of Pedestrian Total	Percent of Bicycle Total
1	1,993 / 9%	304 / 8%	222 / 9%
2	1,858 / 8%	330 / 8%	132 / 5%
3	2,310 / 11%	649 / 17%	290 / 11%
4	1,151 / 5%	214 / 5%	85 / 3%
5	2,371 / 11 %	362 / 9%	347 / 14%
6	5,881 / 27 %	1,218 / 31%	999 / 39%
7	1,695 / 7 %	285 / 7%	105 / 4%
8	1,705 / 7 %	233 / 6%	290 / 11%
9	1,817 / 8 %	274 / 7%	224 / 9%
10	2,366 / 11 %	263 / 7%	157 / 6%
11	1,598 / 7 %	285 / 7%	90 / 4%
TOTAL	21,921	3,920	2,539

### Bicycle-Pedestrian Collisions

In 2010 there were 19 reported injury collisions between bicycles and pedestrians and no fatalities. In 2011 that figure rose to 31 injury collisions, one bicycle fatality and one pedestrian fatality. The 31 bicycle-pedestrian collisions constitute about 4 percent of injury pedestrian collisions and 5 percent of injury bicycle collisions reported in 2011.

## **PART 5: MUNICIPAL RAILWAY COLLISIONS**

The source of the collision data for this section is the SFMTA's TransitSafe database. This database includes all SFMTA-reported incidents involving Muni vehicles regardless of whether an SFPD collision report was filed. Table 16 provides a summary of the collision totals from 2006 to 2011 by degree of severity. Injury collisions have dropped by almost 50 percent in five years. A number of factors are helping improve safety, including improved motoring of incidents and training.

TABLE 16  
Muni Reported Fatal and Injury Collisions (2006-2011)

	2006	2007	2008	2009	2010	2011
Fatal	4	8	5	2	3	3
Non-Fatal Injury	191	197	179	136	131	100
TOTAL	195	205	184	138	134	103

Table 17 summarizes injury and fatal collisions between Muni and pedestrians. The data is divided into rail and bus modes. The trend for 2011 was positive, with an overall decline in incidents relative to previous annual totals.

TABLE 17  
Muni Reported Bus and Rail Collisions Involving Pedestrians (2006-2011)

	2006	2007	2008	2009	2010	2011
Bus-Pedestrian Fatal	2	4	1	0	1	2
Bus-Ped Non-Fatal Injury	31	34	37	27	28	16
Rail-Pedestrian Fatal	1	3	3	2	1	1
Rail-Ped Non-Fatal Injury	13	17	18	8	14	13
TOTAL	47	58	59	37	44	32

## PART 6: OTHER MOTOR VEHICLE INVOLVED COLLISIONS

Table 18 has annual total of reported injury collisions involving taxis according to SFPD statistics. The 228 injury collisions reported in 2011 constitutes about 7 percent of the total citywide injury collisions.

TABLE 18  
Taxi Involved Injury Collisions (2007-2011)

	2007	2008	2009	2010	2011
Injury Collisions	211	214	224	219	228

Figure 16 shows collision trends for collisions where one of the vehicles was a motorcycle. Collisions reached their lowest levels in 2004-2006, with a recent up trend.

FIGURE 16  
San Francisco Injury Collisions Involving Motorcycles  
(2000-2011)

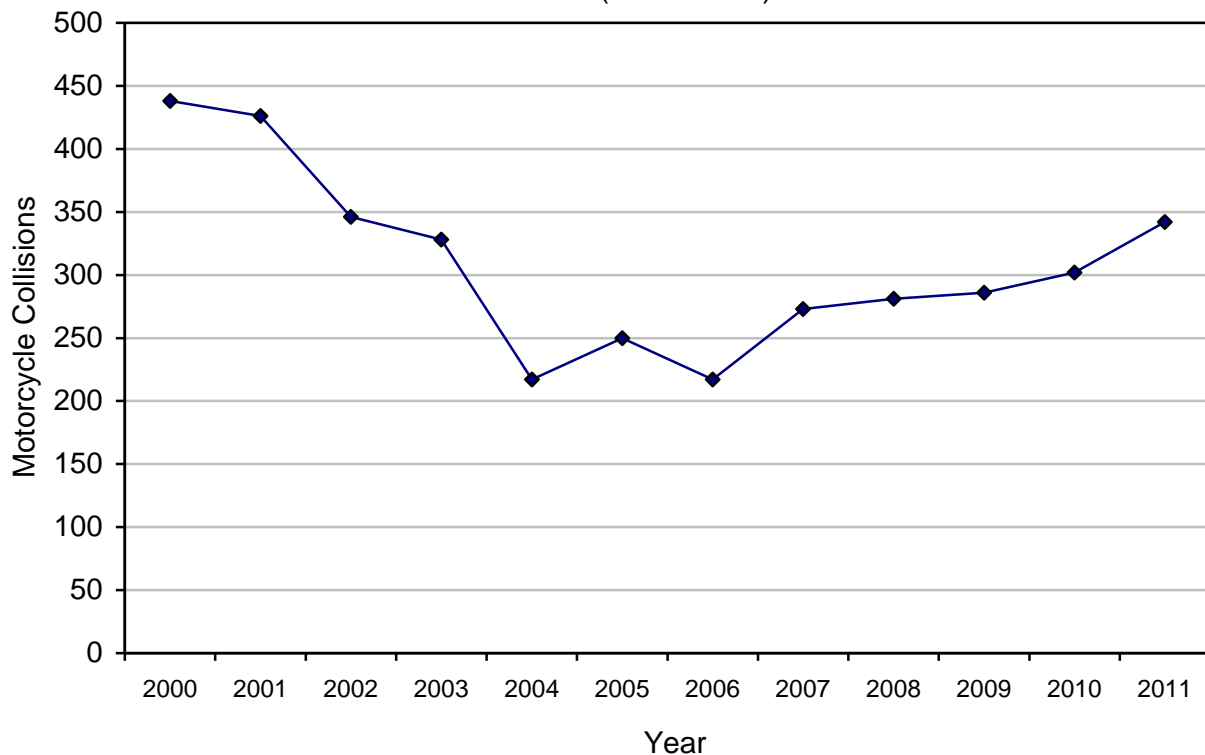


Figure 16: San Francisco Injury Collisions Involving Motorcycles (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	438	426	346	328	217	250	217	273	281	286	302	342

Figure 17 shows collision trends for collisions where a motor vehicle was involved with another motor vehicle. Collisions reached their lowest recorded levels in 2009-2011 after a steady decline in the past two decades. Vehicle on vehicle collisions are down more than 50 percent from the levels recorded in the late 1990s.

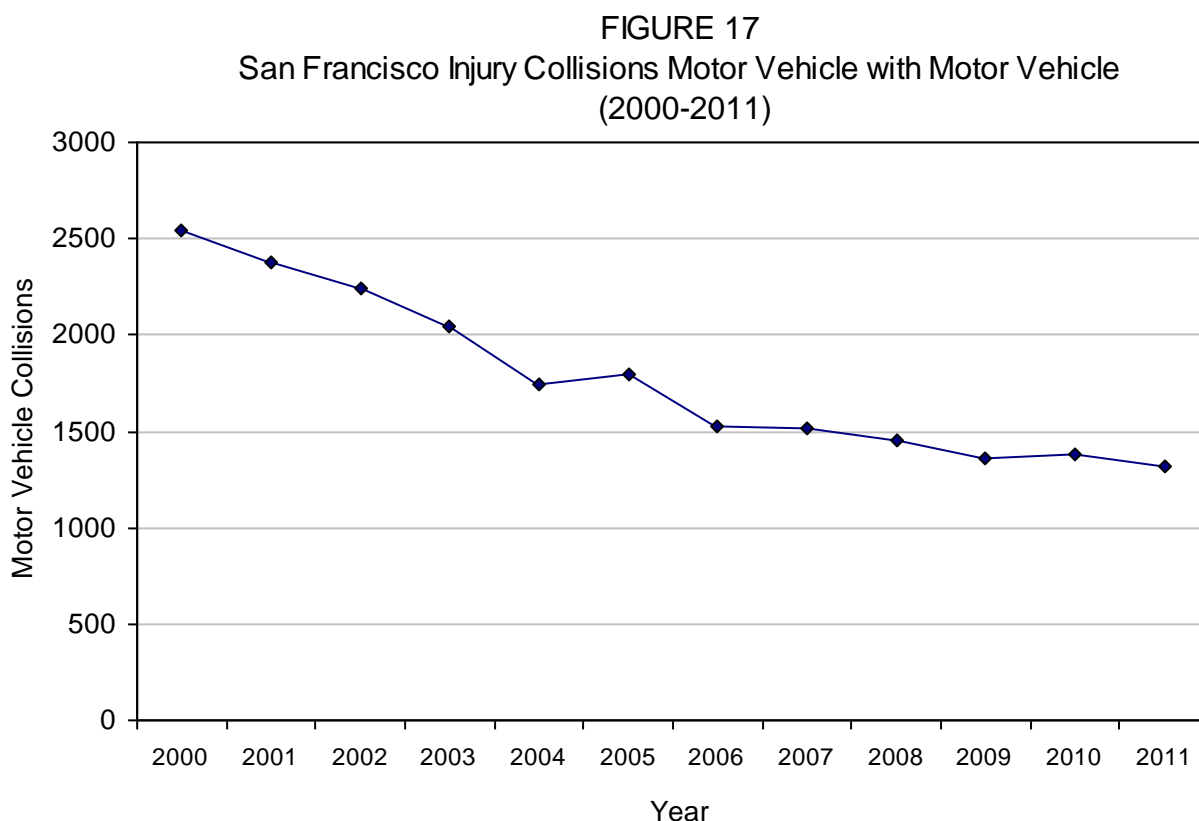


Figure 17: San Francisco Injury Collisions, Motor Vehicle-Motor Vehicle (2000-2011)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	2547	2379	2238	2043	1747	1799	1527	1518	1453	1357	1377	1321

## PART 7: COLLISIONS AT LOCATIONS WITHOUT A TRAFFIC SIGNAL

Due to their higher traffic volumes, the intersections with the highest collision totals in the City are signalized. Mitigation measures for lower volume intersections are generally different than those for signalized intersections. They can include installation of additional STOP signs, new traffic signals, new traffic regulations, or parking restrictions. Table 19 includes the highest reported collision intersections for the five year period ending in the first quarter of 2011. Table 20 does the same for pedestrian collisions. A majority of these intersections are funded to receive new traffic signals, or had traffic signals recently completed.

TABLE 19  
Highest Five-Year Reported Collisions at Unsignalized Intersections (2007-2011)  
Intersections with 11 or more reported collisions

TOTAL	INTERSECTION	NOTE
15	John Muir Dr at Lake Merced Blvd	To be signalized (under design)
13	San Jose Ave at Liebig St	Caltrans street redesign (2012)
13	Cayuga Ave at Geneva Ave	To be signalized (under design)
13	16th St at Capp St	To be signalized (under design)
12	Sunset Blvd at Ulloa St	To be signalized (under design)
12	6th St at Minna St	To be signalized (under design)
11	Grove St at Divisadero St	Signalized (completed 2012)
11	16th St at Rhode Island St	Signalized (completed 2012)

TABLE 20  
Highest Five-Year Pedestrian Collisions at Unsignalized Intersections (2007-2011)  
Intersections with 4 or more reported collisions

TOTAL	INTERSECTION	NOTE
5	Geneva Ave at London St	Added red zones, new crosswalk markings, advance yield lines (2011)
5	Webster St at O'Farrell St	All-way STOP, reviewed in 2011
5	6th St at Jessie St	Added red zones, under review for further changes
4	Sunset Blvd at Ulloa St	To be signalized (under design)
4	Cayuga Ave at Geneva Ave	To be signalized (under design)
4	Grove St at Divisadero St	Signalized (completed 2012)
4	18th St at Collingwood St	Added red zones at intersection (2010)
4	16th St at Capp St	To be signalized (under design)
4	6th St at Stevenson St	Added red zones, under review for further changes
4	Powell St at Washington St	To be signalized (under design)

## **PART 8: SAFER STREETS FOR SAN FRANCISCO**

Below we highlight a few of the on-going SFMTA Sustainable Streets Division safety initiatives.

Regular Collision Totals Review. Since the mid 1990's transportation engineering staff has analyzed highest collision locations to determine possible mitigation measures and to prioritize capital investments. Collision analysis software and electronic mapping systems are used to identify higher collision locations and review specific collision patterns. SFMTA staff also reviews hundreds of safety improvement suggestions submitted by the public every year.

New Signals and Signal Upgrades. In 1989 San Francisco voters approved a half-cent transportation sales tax which included funding for traffic signal improvements like overhead mast arm signals or new traffic signals at the highest collision intersections. South of Market streets like Bryant, Folsom, Harrison and Howard saw their collision totals drop by 40 to 60 percent in the late 1990's after new pedestrian and larger, more visible overhead signals were installed, helping remove many South of Market intersections from annual highest collision lists. General traffic signal upgrades also benefit pedestrians by installing pedestrian signals at intersections where these devices are not present and by improving the visibility of signal indications to motorists.

Pedestrian Countdown Signals. San Francisco was the first major city to replace all its existing pedestrian signals citywide with LED units that had a countdown display. The positive results from these deployment efforts in the past decade led the federal government to consider requiring these devices at all signals. The SFMTA continues to work on installing countdown units at older signals that lack them (about 30 percent of the city's 1,200 signalized intersections).

Pedestrian Safety. At the citywide level, SFMTA has implemented a variety of measures to improve pedestrian safety, including installing new pedestrian safety signs, improved crosswalk markings, leading pedestrian signal intervals, pedestrian only signal phases, STOP signs, audible pedestrian signals, red zones to improve sight distances, and traffic calming improvements such as sidewalk extensions. SFMTA co-chairs the Pedestrian Safety Task Force and works with local and citywide groups such as the Pedestrian Safety Advisory Committee, Walk San Francisco, and the Senior Action Network on identification of problems and possible improvements.

Educational and Enforcement Efforts. SFMTA works with the Department of Public Health and the San Francisco Police Department on a variety of coordinated safety and enforcement campaigns. Current initiatives include a concentrated enforcement effort



along the highest pedestrian injury corridors in the City.

**Bicycle Safety.** San Francisco is now implementing major bicycle improvements on key routes across the city following completion of the City's Bicycle Plan and the lifting of a legal injunction. San Francisco is also testing innovative bicycle facility treatments that include additional markings, delineators, and green color to enhance their effectiveness. Bicycle projects such as bicycle lanes can also have beneficial effects to pedestrians when they reduce the number of motor vehicle lanes that pedestrians have to cross or when they provide an additional buffer between motor vehicles and sidewalks. Reversing the recent increase in bicycle collisions will remain a major area of focus in the coming years.

**Signal Timing Changes.** SFMTA transportation engineers are continually updating signal timing settings. Currently signals are being adjusted to provide pedestrians time to cross the street at a walking rate of 3.5 feet per second. The previous walking rate in state and federal guidelines was 4 feet per second. SFMTA is also revising signals to provide additional all-red clearance phases, brief periods when signal approaches are red in all directions. This treatment can reduce certain types of collisions such as broadsides.

**Traffic Calming Programs.** The past two decades have seen the development of new and more robust traffic calming programs in San Francisco. Traffic calming is a community-driven process in which residents work with city staff to identify measures to increase safety for all road users by installing roadway features to reduce vehicle speeds and cut through traffic and increase pedestrian visibility. These programs have leveraged local, state, and federal funds to implement a variety of street improvement projects, from traffic calming projects on major arterials (such as road diets) to the installation of speed humps on lower volume residential streets. Currently the SFMTA is evaluating how to use limited traffic calming funds to improve pedestrian safety along major arterials.

**School Safety Program and Crossing Guards.** SFMTA has staff dedicated to work on school-related safety initiatives. These include the review of specific school-related safety and parking complaints, working with school staff on traffic safety concerns, and the proactive installation of fluorescent-yellow green school signs and yellow ladder-type crosswalks around all active school crossings. Safe Routes to School grants have funded major improvements near schools such as sidewalk extensions. On a typical school day over 140 SFMTA School Crossing Guards assist school children crossing major intersections.

There is much work that remains to be done. Concerted action to make San Francisco's streets safer will be required until there are no collisions to report.